WBS 3.0 C-0 Outfitting

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WBS 3.0 Level II Manager

Current Conditions

- In 1998 Fermilab constructed a Collision Hall and very basic building shell at the Main Ring C-0 Station.
- The project “C-0 Test Area” was constructed safely, on time, and within budget.
- UIP project stubbed in adequate ICW (Fire Protection water), Domestic Water, Sanitary Sewer, and natural gas.

Overall Scope

- C-0 Building
  - Architectural and structural finish out including:
    - Two Mezzanine floors
    - Stairs, elevator, partitions, toilet rooms.
    - Floor and wall finishes including raised computer floors.
  - Mechanical Systems
    - HVAC systems including collision hall and assembly hall purge.
    - Chilled water system, chiller, pumps, and distribution piping.
    - High density computer room cooling.
    - Fire protection throughout the facility.
  - Electrical
    - Primary Power – 3 - 1500 KVA substations.
    - Three distribution subsystems; power supplies, quiet electronics, & house power.
    - 250 KVA Generator.

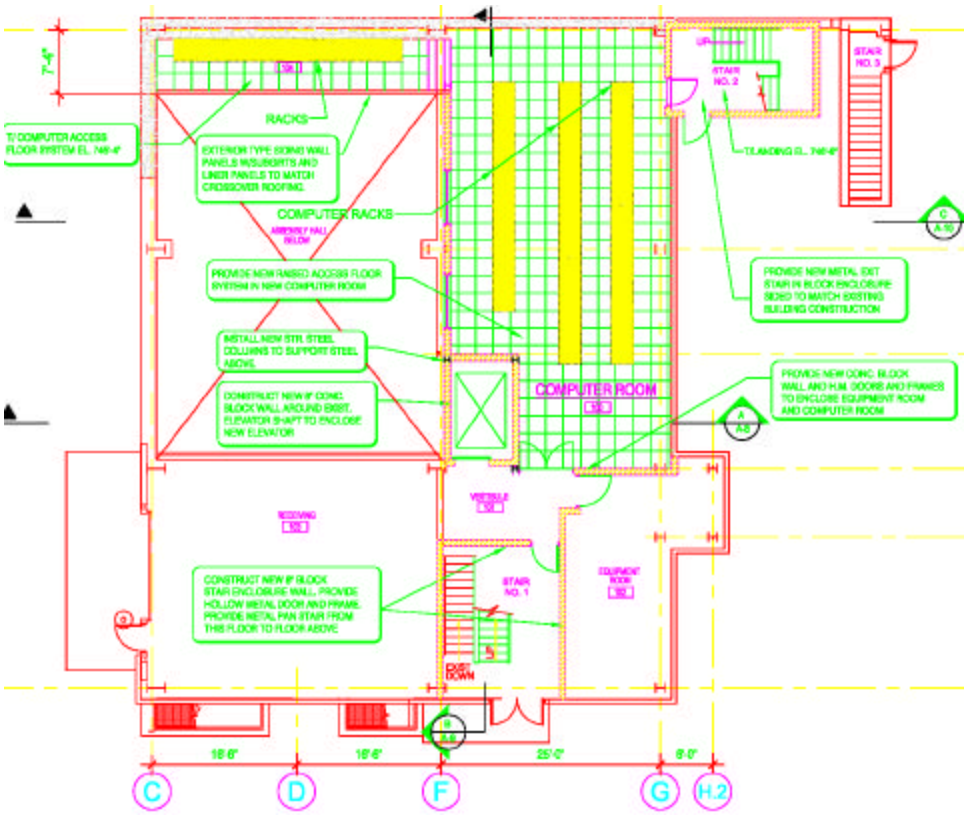
Overall Scope

- IR Support
  - Primary Power; 1500 KVA transformer at C-0, 500 KVA transformers at B-4 and C-1.
  - 480 V secondary including panel boards.
  - Minor C-0 Service Building Architectural Modification.
  - Heated enclosure for outside bus between C-0 Service Building and penetrations leading to enclosure.
- Infrastructure
  - 13.8 KV feeder from Kautz Road Substation to C-0 Building.

Misc. Quantities

- Structural Steel – 17.1 tons
- Structural Concrete – 95 cubic yards
- Concrete Masonry – 8400 sf
- Chillers – 120 tons
- High Density Cooling - 120 tons
- Major HVAC systems - 2
- New Fire Protection coverage – 9600 sf
- Installed Primary Power – 7 MVA
- 13.8 kv Feeder - 11,000 ft.
- 2000 amp switchboards – 4
- Electrical Distribution Panels – 22
- Motor Control Centers - 2

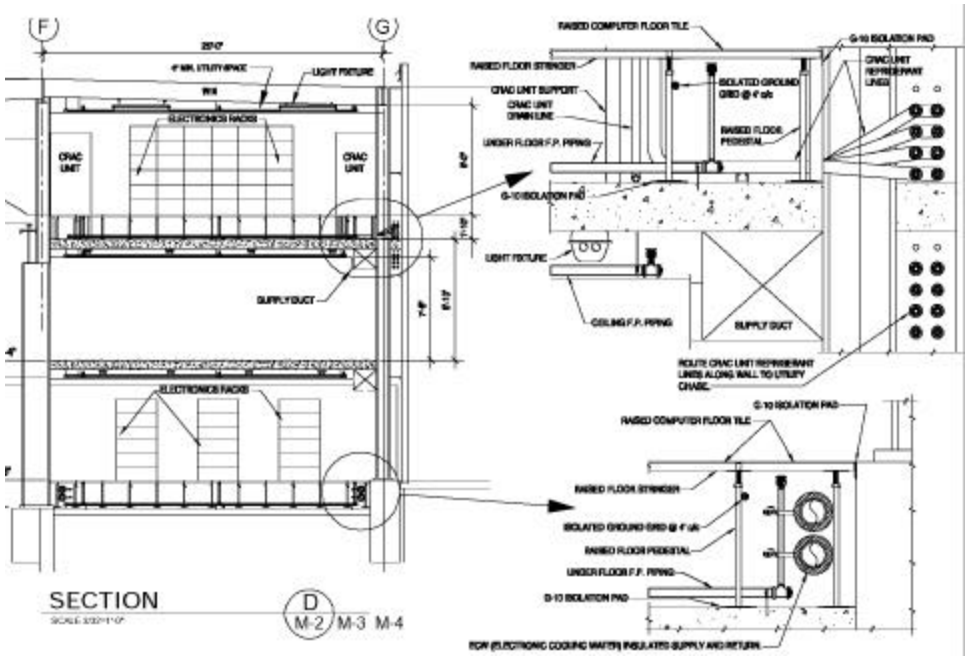
C-0 Outfitting Phase I



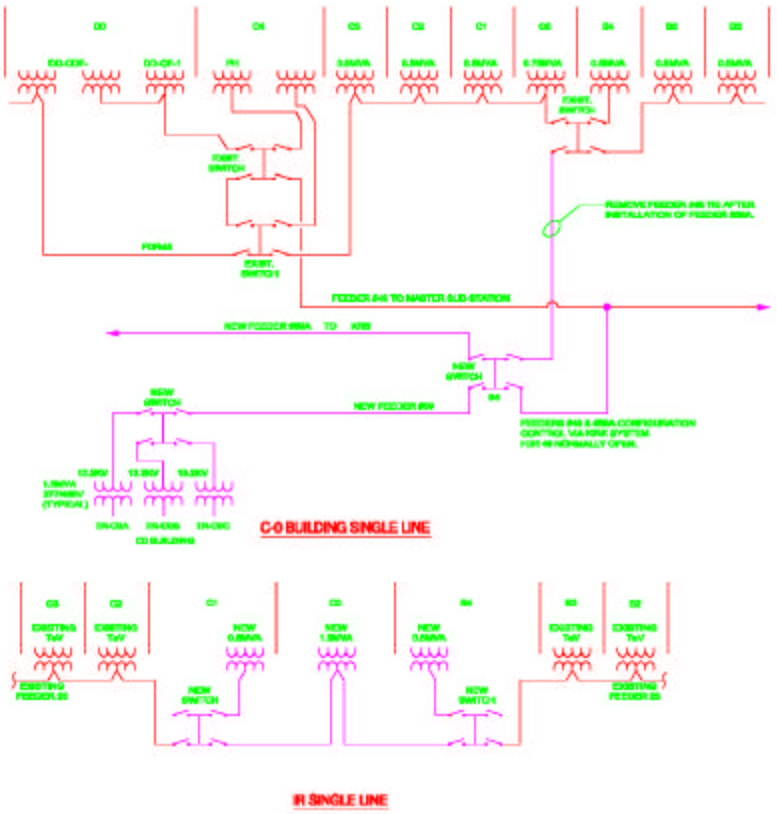
- The scope of Phase I is those items of work required to give Beneficial Occupancy of the Assembly Hall at El. 715 and the Receiving Area to allow magnet and torroid construction to begin.
- Installs the Mezzanine and concrete block partitions, stairs, elevator, toilet rooms, fire protection, fire detection and power to test analysis magnets.
- Start ASAP
- Beneficial Occupancy by February 1, 2006.
- (See WBS 1.10 for magnet and torroid construction schedule)

C-0 Outfitting Phase II

- Completes remainder of scope in and around C-0 Building.
- Installs HVAC, chilled water, high density computer room cooling, raised computer floors, finishes,remaining primary power, user and house power distribution.
- Delay start of this work will allow us to take advantage of continuing development of high density cooling systems.
- Start Design Mid FY '06
- Start Const. Early FY '07
- Finish Early FY '08



C Sector High Voltage Upgrade



- Installs IR feeder connections to feeder 23 at C-0, B-4 and C-1.
- Installs new feeder 59A from KRS to B-4.
- Start early FY '06
- Finish early FY '07

EDIA, Construction, Indirects & Contingency

Activity ID	Activity Description	Material & ServicesCost	Base Budget	Materials & Services Contingency ($)	Total Budget (Base + Contingency)
CONSTRUCTION					
		$5,980,763	$5,980,763	$1,196,152	$7,176,915
1 -- C-0 Outfitting Phase 1					
		$2,239,237	$2,239,237	$447,847	$2,687,084
2 -- C-0 Outfitting Phase 2					
		$2,303,017	$2,303,017	$460,603	$2,763,621
3 -- C Sector High Voltage Power Upgrade					
		$774,768	$774,768	$154,953	$929,722
4 -- Pre Procured Items					
		$663,739	$663,739	$132,747	$796,487

Cost and Schedule Summary

- WBS 3.0 TEC of $7,177K is within acceptable project limits.
- FY 05 Cost and Commitment profile conforms to project's cost profile.
- Estimate contains 20% Management Reserve / Contingency.
- Cost developed using Means Cost Data, manufacturers quotes, and DOE guidelines for EDIA and Management Reserve.
- Estimate in FY '05 dollars.

- Schedule and phasing meets the project requirements.

ES&H

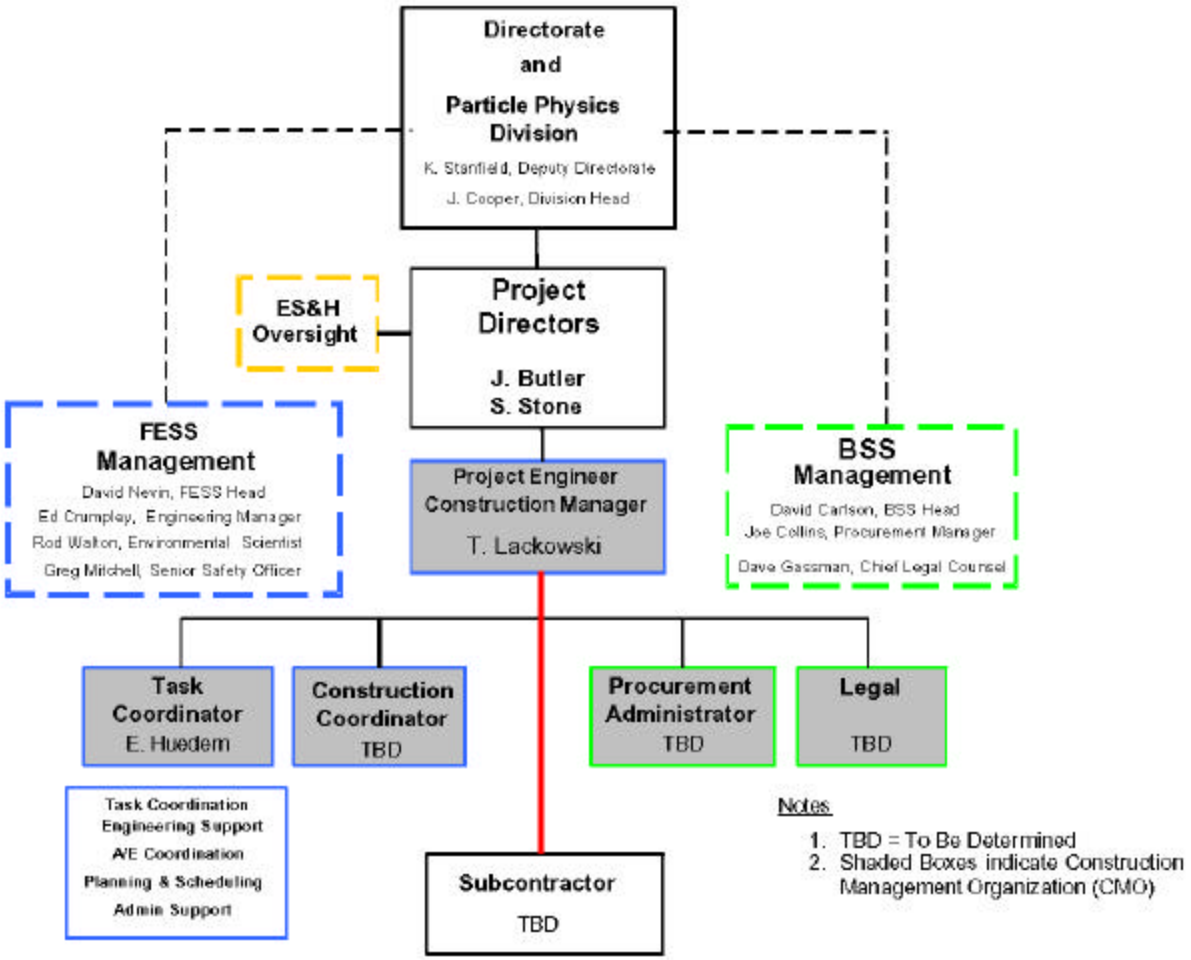
- The ability to perform the construction work safely will be designed into the project. Construction documents (drawings and specifications) will be reviewed as the documents are developed, by Fermilab engineering, construction, and safety professionals to ensure ES&H concerns are addressed.
- Project specific safety and health requirements for construction will be outlined in the construction documents.
- The Construction Manager shall be the first line of contact with the Construction Subcontractor's organization.
- During construction the Subcontractors will use Project Hazard Analyzes (PHA) to plan the work and mitigate hazards.

- Project NEPA has been approved as a Categorical Exclusion (CX).

ES&H

- Line management for safety on this project will be the responsibility of the Particle Physics Division (PPD).
- Although line management will be the responsibility of PPD it is understood that for the work that is within the geographical boundaries of the Accelerator Division (AD), the AD rules and guidelines will be followed. To insure this, all work notification and excavation permits will obtain the approval of the AD Senior Safety Officer.

Line Management



Recommendations

- Develop a schedule including a model of laboratory shutdowns to refine the scope and sequence of C-0 Outfitting contracts, and to identify any places where the C-0 Outfitting impacts the project critical path.

  - The schedule includes the current model for accelerator shutdowns. Contract work that requires accelerator shutdown is not schedule critical.
  - The WBS 3.0 schedule is integrated with the other BTeV subprojects. The Phase I Beneficial Occupancy has the least float when integrated with other portions of the project, but is not critical.

Recommendations

- Define a formal approval procedure to ensure that all physics subsystem requirements, including schedule requirements, are transmitted to the Civil Construction managers and approved by all other relevant system managers.

➢ Technical Board meetings, Comment and Criteria review, System Criteria documents from WBS 1.10, weekly coordination meetings with WBS 1.10 and 2.0 management, presentations at collaboration meetings and a really cool web site where everything is documented provides in aggregate a bi-directional conduit for requirements between the BTeV subproject managers, the laboratory as a whole and WBS 3.0.

Recommendation

- Produce a complete drawing set of the conceptual design including electrical and process piping required for the Collision Hall and Assembly Hall.

➢ A complete set of drawings, estimate and write –up exists that clearly delineates the required scope.

In Summary

- The documents presented provide a design, cost estimate and schedule based on sound, professional engineering. Thanks to Emil Huedem, Gary Van Zandbergen, Jim Niehoff and Hanson Engineering.
- The WBS 3.0; C-0 Outfitting CDR provides the scope, cost and schedule consistent with the requirements of the BTeV project.
- The WBS 3.0; C-0 Outfitting CDR documents presented for this review are at, or exceed, the requirements for successful CD-1 approval.